

【CLAIMS】**【Claim 1】**

A regenerative thermal oxidizer to burn process gases, comprising:

- a reaction chamber having a combustion unit to burn the process gases;
- a heat exchanging part placed to be in contact with the reaction chamber and comprising a plurality of sectors for heat exchange of the process gases;
- a first duct communicating with an outside through an upper end of the regenerative thermal oxidizer while passing through the heat exchanging part;
- a second duct provided on a lower end of the regenerative thermal oxidizer to supply or discharge the process gases into or from the heat exchanging part;
- a cylindrical rotor provided under the heat exchanging part, and comprising: an upper opening provided on an upper surface of the cylindrical rotor which is in contact with the first duct; and a lower opening provided on a lower surface of the cylindrical rotor opposite to the upper opening, wherein the upper opening provides a first gas flow path to connect some of the sectors of the heat exchanging part to the outside of the regenerative thermal oxidizer through the first duct, and the lower opening provides a second gas flow path to connect other sectors of the heat exchanging part to the outside of the regenerative thermal oxidizer through the second duct;
- a plurality of partitioning plates to define the sectors of the heat exchanging part and to prevent the process gases passing through the first and second gas flow paths below the heat exchanging part from mixing with each other; and
- a drive unit coupled to a lower end of the cylindrical rotor to rotate the cylindrical rotor at a predetermined speed.

【Claim 2】

The regenerative thermal oxidizer according to claim 1, wherein the cylindrical rotor comprises upper and lower cylinders which are integrally operated, so that the upper opening is provided on the upper surface of the upper cylinder and the lower opening is provided on the lower surface of the lower cylinder, wherein

the upper and lower cylinders comprise first and second side openings, respectively, so that both the upper opening and the first side opening are placed on the first gas flow path while both the lower opening and the second side opening are placed on the second gas flow path.

【Claim 3】

The regenerative thermal oxidizer according to claim 1, wherein the upper opening is provided on a central portion of the upper surface of the cylindrical rotor, and the lower opening is provided along a circumference of the lower surface of the cylindrical rotor, wherein

the cylindrical rotor further comprises first and second side openings provided on opposite sidewalls of the cylindrical rotor, and

both the upper opening and the first side opening are placed on the first gas flow path while both the second side opening and the lower opening are placed on the second gas flow path.

【Claim 4】

The regenerative thermal oxidizer according to claim 2 or 3, wherein the upper opening is rotatably in close contact with the first duct.

【Claim 5】

A regenerative thermal oxidizer to burn process gases, comprising:

- a reaction chamber having a combustion unit to burn the process gases;
- a heat exchanging part placed to be in contact with the reaction chamber and comprising a plurality of sectors for heat exchange of the process gases;
- a first duct communicating with an outside through an upper end of the regenerative thermal oxidizer while passing through the heat exchanging part;
- a second duct provided on a lower end of the regenerative thermal oxidizer to supply or discharge the process gases into or from the heat exchanging part;
- a plate type distribution rotor provided under the heat exchanging part, and comprising: a gas outlet having a plurality of slots, communicating with the first duct, and provided on a central portion of the plate type distribution rotor; a plurality of openings provided on predetermined positions along a circumference of the plate type distribution rotor, wherein the gas outlet having the plurality of slots provides a first gas flow path to connect some of the sectors of the heat exchanging part to the outside of the regenerative thermal oxidizer through the first duct, and the plurality of openings provides a second gas flow path to connect other sectors of the heat exchanging part to the outside of the regenerative thermal oxidizer through the second duct;
- a plurality of partitioning plates to define the sectors of the heat exchanging part while extending to a lower end of the heat exchanging part to prevent process gases passing through the first and second gas flow paths from mixing with each other; and
- a drive unit coupled to a lower end of the plate type distribution rotor to rotate the plate type distribution rotor at a predetermined speed.

【Claim 6】

A regenerative thermal oxidizer to burn process gases, comprising:

a reaction chamber having a combustion unit to burn the process gases;

a heat exchanging part placed to be in contact with the reaction chamber and comprising a plurality of sectors for heat exchange of the process gases;

a first duct communicating with an outside through an upper end of the regenerative thermal oxidizer while passing through the heat exchanging part;

a second duct provided on a lower end of the regenerative thermal oxidizer to supply or discharge the process gases into or from the heat exchanging part;

a ring type distribution rotor provided under the heat exchanging part, and comprising: two concentric rings comprising an inner ring and an outer ring; and at least two partitioning blades extending from an outer surface of the inner ring to the outer ring to partition the outer ring into at least two sections, wherein the inner ring is coupled to the first duct and provides a first gas flow path to connect some of the sectors of the heat exchanging part to the outside of the regenerative thermal oxidizer through the first duct and a side opening of the inner ring, and the outer ring provides a second gas flow path to connect other sectors of the heat exchanging part to the outside of the regenerative thermal oxidizer through the second duct and a part of the sections partitioned by the partitioning blades;

a plurality of partitioning plates to define the sectors of the heat exchanging part while extending to a lower end of the heat exchanging part to prevent the process gases passing through the first and second gas flow paths from mixing with each other; and

a drive unit coupled to a lower end of the ring type distribution rotor to rotate the ring type distribution rotor at a predetermined speed.

【Claim 7】

The regenerative thermal oxidizer according to claim 6, further comprising:

a distribution plate mounted to the first duct and having a plurality of openings to distribute the process gases to be supplied into or discharged from the ring type distribution rotor.

【Claim 8】

A regenerative thermal oxidizer to burn process gases, comprising:

a reaction chamber having a combustion unit to burn the process gases;

a heat exchanging part placed to be in contact with the reaction chamber and comprising a plurality of sectors for heat exchange of the process gases;

a first duct communicating with an outside through an upper end of the regenerative thermal oxidizer while passing through the heat exchanging part;

a second duct provided on a lower end of the regenerative thermal oxidizer to supply or discharge the process gases into or from the heat exchanging part;

a rotor-shaped distribution unit placed to be in close contact with the first duct and provide both a first gas flow path which is associated with the first duct and provided above the rotor-shaped distribution unit and a second gas flow path which is associated with the second duct and provided below the rotor-shaped distribution unit;

a plurality of partitioning plates to define the sectors of the heat exchanging part while extending to a lower end of the heat exchanging part to prevent the process gases passing through the first and second gas flow paths from mixing with each other; and

a drive unit to rotate the rotor at a predetermined speed.